

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE
General Certificate of Education
Advanced Subsidiary/Advanced



CYD-BWYLLGOR ADDYSG CYMRU
Tystysgrif Addysg Gyffredinol
Uwch Gyfrannol/Uwch

311/01

BIOLOGY

MODULE BI1

A.M. TUESDAY, 8 June 2004

(1 hour 30 minutes)

For Examiner's Use Only

Total Marks	
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INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

The quality of written communication will affect the awarding of marks.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

1. Fully complete the following table using a tick (✓) if the atoms/structures **could be** present in the molecules indicated and a cross (X) if the atoms/structures are **not** present in the molecules. [6]

	<i>Protein</i>	<i>DNA</i>	<i>Disaccharide</i>	<i>Phospholipid</i>
Carbon and Hydrogen and Oxygen				
Nitrogen and Sulphur				
Disulphide bonds				
Glycosidic bonds				
Peptide bonds				
Ester bonds.				

(Total 6 marks)

2. The following diagrams represent the structure of some common **carbohydrates**.

(a) Using a letter from the diagram identify the following carbohydrates. [5]

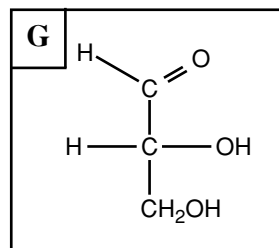
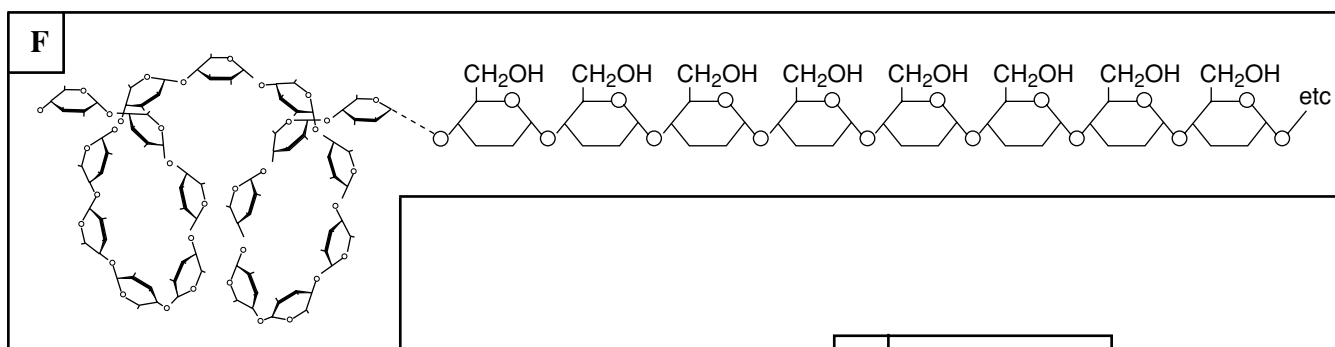
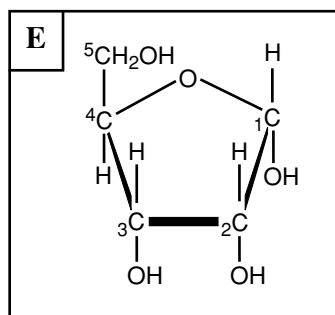
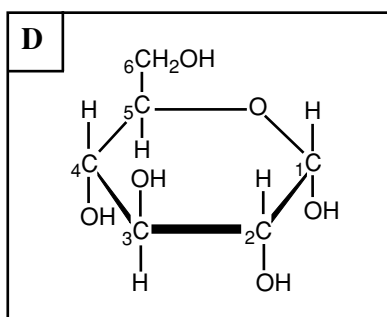
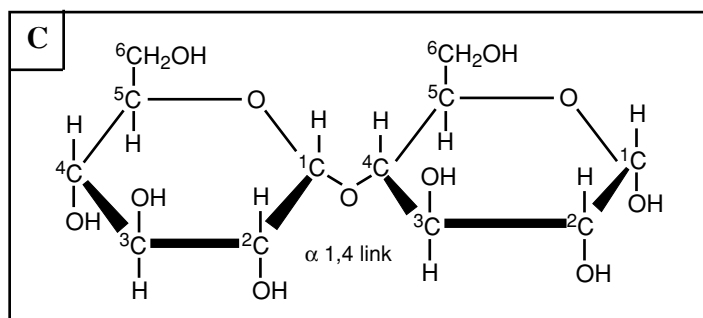
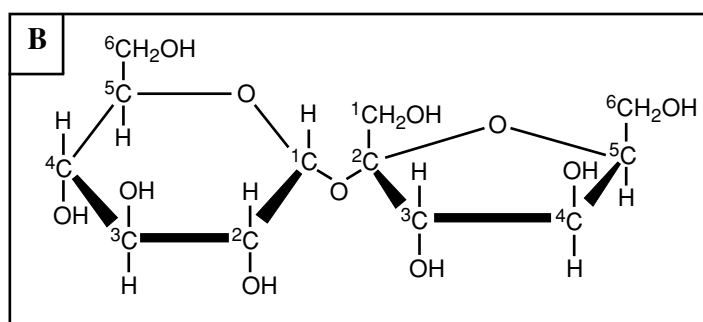
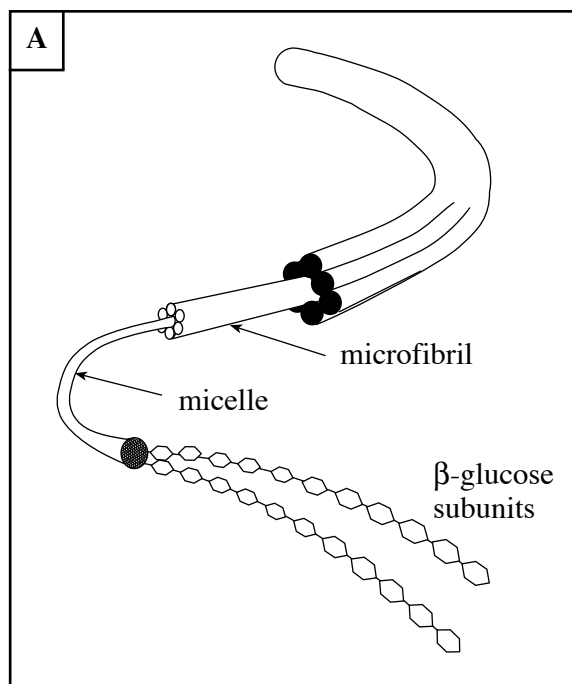
Triose

Amylose

Maltose

Cellulose

Alpha glucose



- (b) Polysaccharides are often used by cells to store energy, suggest **two** reasons why polysaccharides are ideal for this function. [2]

1

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2

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- (c) Briefly explain how you could distinguish, using a practical technique, between the presence of a reducing sugar such as maltose and a non-reducing sugar, such as sucrose. [3]

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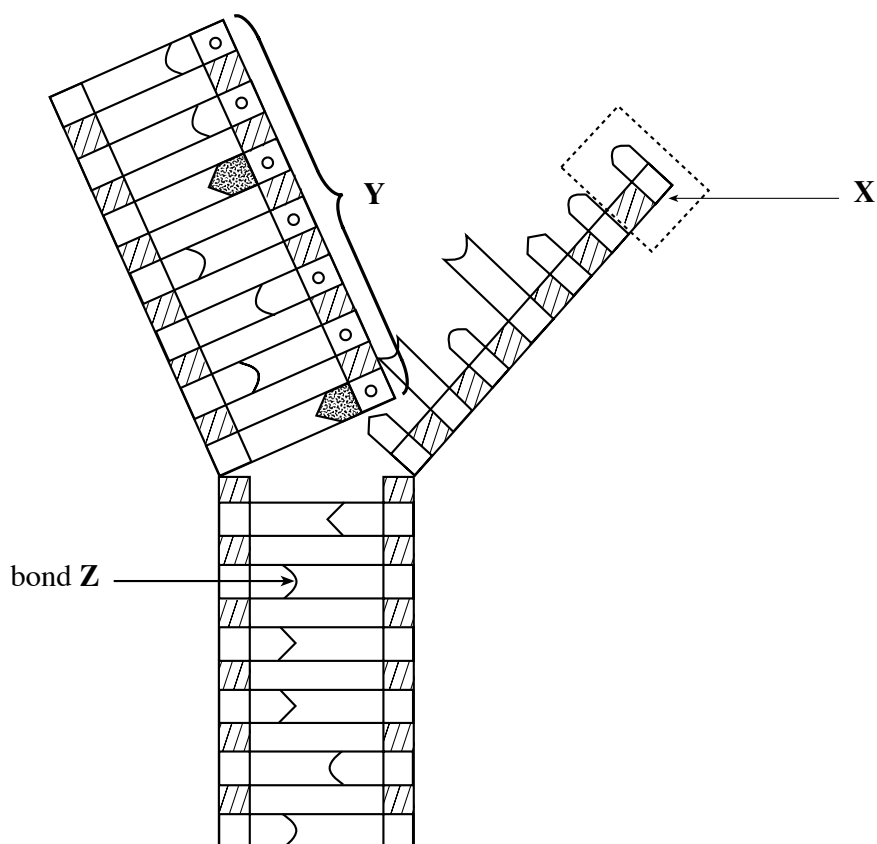
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(Total 10 marks)

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3. The following diagram represents part of a DNA molecule and a mRNA molecule.



- (a) The key for the diagram is shown below, as a table. Complete the table.

[4]

Symbol	Name of molecule
	Deoxyribose
	Phosphoric acid
	Ribose
Pyrimidine base 	Uracil
Pyrimidine base 	
Pyrimidine base 	
Purine base 	
Purine base 	

(b) (i) Name the subunit labelled **X**. [1]

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(ii) Give the names of the component molecules which make up this structure. [3]

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(c) Name bond **Z** as shown on the diagram. [1]

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(d) Condensation reactions are involved in the production of DNA. Give the name of **one pair** of molecules which are linked in such a way. [1]

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(e) Give **two** pieces of evidence from the diagram which indicate that the molecule Y is RNA and not half a strand of DNA. [2]

1

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2

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(Total 12 marks)

4. (a) In the space below draw a diagram to show the structure of the cell membrane as proposed by Singer and Nicolson in their *fluid mosaic* model. Label your diagram. [6]

- (b) Explain why the words *fluid* and *mosaic* are used to describe the structure of the membrane. [2]

Fluid

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Mosaic

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- (c) Cells can be 'stained' using chemicals dissolved in water. When sections of the cell membrane from such 'stained' cells are observed using the electron microscope, the membrane has a three layered appearance as shown below.



Suggest why the membrane has this appearance.

[1]

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- (d) Give the names of **three** structures surrounded by a double membrane which are found within cells. [2]

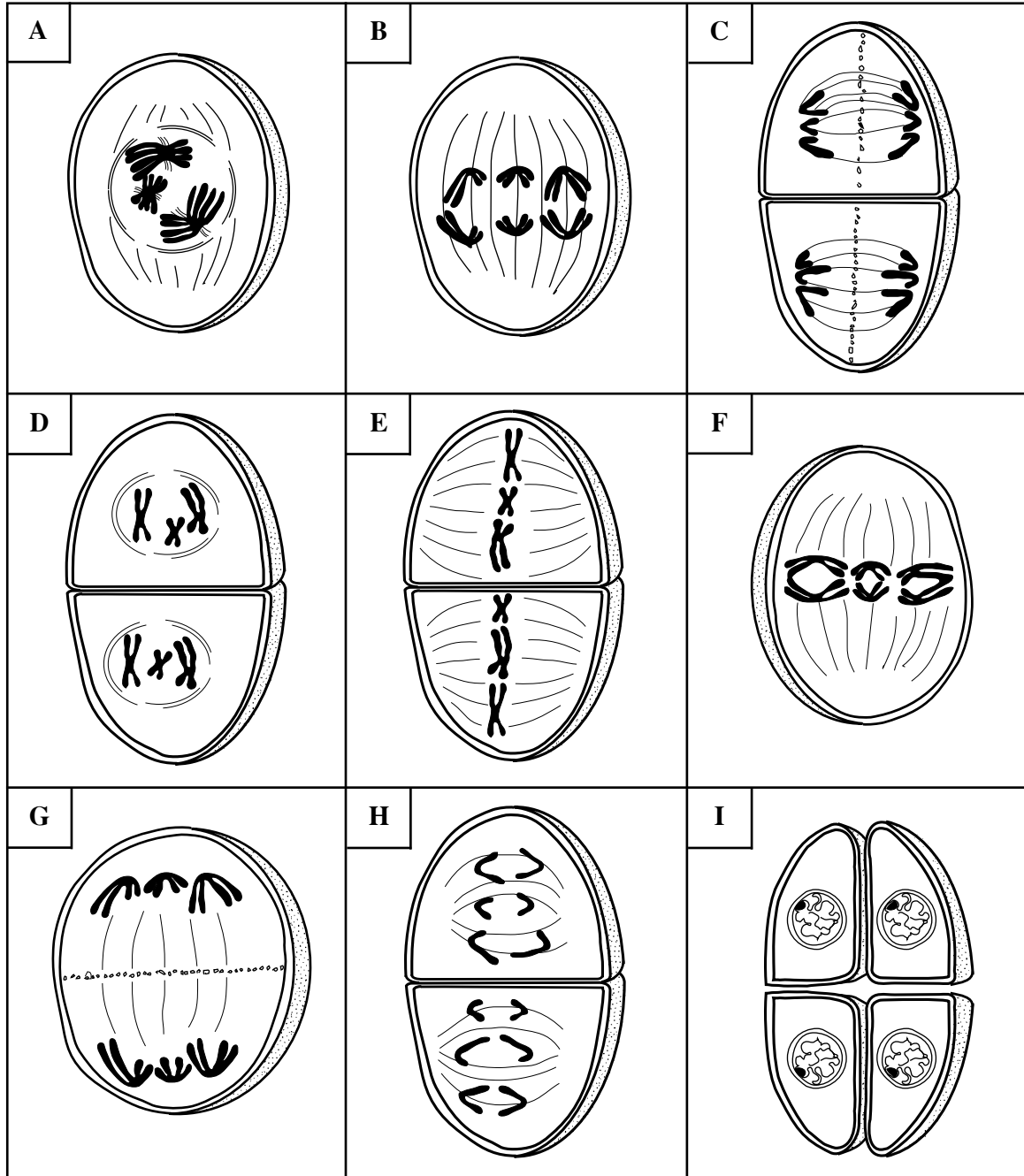
1

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3

(Total 11 marks)

5. The drawings below show nuclei and cells at various stages during nuclear division in a flowering plant.



- (a) What sort of nuclear division is shown? [1]

- (b) Drawing I shows the last stage in the sequence. In the boxes below, arrange the other letters shown on the drawings to indicate the correct chronological sequence for this type of nuclear division. [3]

								I
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- (c) Suggest **one** process which has occurred in the nucleus of the cell shown in A but not in the nuclei of cells shown in D. [1]

- (d) How is variation brought about by meiosis in living organisms? [3]

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- (e) A student counted the number of root tip cells showing metaphase and found that this number was twice the number of cells showing anaphase. What conclusion can you reach from this observation about the length of the stages? [1]

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(Total 9 marks)

6. (a) Define the following terms as used to describe enzyme inhibition.

[6]

Competitive inhibitor

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Non competitive inhibitor

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End product inhibition

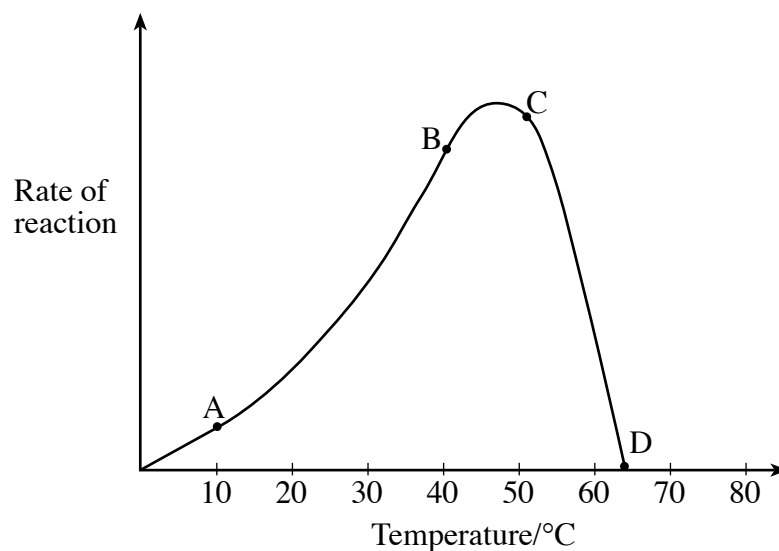
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- (b) The graph represents the effect of an increase in temperature on the rate of enzyme activity.



Give an explanation for the shape of the curve between A and B and C and D. [4]

A and B

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C and D

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- (c) Suggest why the temperature of a mammal is maintained just below the optimum temperature for the enzymes in that mammal. [2]

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(Total 12 marks)

Any diagrams included in your answer must be fully annotated.

Or (b) Describe the biological principles involved in the use of:

(ii) genetic finger printing. [10]

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Turn over.

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